SECTION 3: STORMWATER BEST MANAGEMENT PRACTICES

3.1 Overview of Stormwater BMPs

BMPs can generally be classified into two categories: (1) Pollution Prevention BMPs and (2) Runoff/Pollution Control BMPs. An overview of these two categories are discussed below.

3.1.1 Pollution Prevention BMPs

Pollution prevention BMPs are **activities** that are implemented to control pollution **at the source** by preventing pollutants from commingling with stormwater runoff. Pollution prevention BMPs are often much less expensive and more effective than BMPs which manage stormwater after pollutants have migrated into the runoff. Implementing pollution prevention BMPs is very important to improving the quality of our surface waters and overall environment.

The pollution prevention BMPs presented in this manual are beneficial for reducing pollutants in stormwater runoff. The City promotes pollution prevention BMPs that are relatively easy to implement and, in many cases, required by other environmental regulations for specific types of properties (for example, NPDES requirements for permitted industrial sites). Some facilities in Greensboro should already be implementing these practices. If a facility is not employing these practices at this time, the pollution prevention BMPs presented generally require only relatively minor efforts to implement and can provide significant stormwater pollution reduction.

Pollution prevention BMPs can be utilized to meet industrial NPDES requirements and to receive credit on the stormwater utility fee. Because most of these practices are easy to implement and effective in promoting a cleaner, healthier environment, the City encourages all businesses and interested citizens to use these practices.

The following pollution prevention BMPs are discussed in Section 3.2 of this manual:

- ⇨ Employee education
- ⇨ On-site refuse management
- ⇨ Stormwater system maintenance
- ⇨ Paved area sweeping
- ⇨ Used oil recycling
- ⇨ Covering
- ⇨ Spill containment
- ⇨ Soil erosion control

This list of BMPs is not intended to be exhaustive, but rather to give some of the most effective BMPs for preventing pollution of stormwater runoff from developed areas.

3.1.2 Stormwater Quality/Quantity Control BMPs

Stormwater quality/quantity control BMPs are site design/planning practices, improvements, facilities, etc., that serve to reduce the total volume of runoff generated, reduce peak runoff discharge rates, and provide surface water quality protection by minimizing impacts to environmentally sensitive areas and removing pollutants from stormwater runoff. These BMPs can be non-structural/site development BMPs or structural BMPs.

Non-Structural BMPs

Non-structural BMPs can be defined as **techniques incorporated in site design/planning** to promote low-impact development. These BMPs may be used to reduce the volume of runoff generated, reduce runoff discharge and provide partial pollutant removal. These practices are relatively inexpensive to implement, with the major cost usually being land area. But, with thoughtful site design, these practices can improve the stormwater management and aesthetic value of the development.

These stormwater BMPs can be implemented to help meet requirements for "low density" development in water-supply watershed areas and to reduce the amount of impervious area that is required to be treated for "high density" development. These BMPs can be incorporated in the site design to reduce stormwater runoff quantity and prevent adverse effects on the downstream property and receiving streams. Non-structural BMPs can be used to receive credit on the stormwater utility fee.

The following non-structural BMPs, which have been observed to be effective, are discussed in Section 3.3 of this manual:

- ⇨ Open vegetated conveyances
- ⇨ Stream buffers
- ⇨ Disconnect rooftop drainage
- ⇨ Clustering/Conservation of natural areas
- ⇨ Grass paving
- ⇨ Natural infiltration

Structural BMPs

Structural BMPs can be defined as **"engineered stormwater management facilities"** that can be designed to improve the quality of stormwater runoff and reduce stormwater runoff rates and/or volumes. These BMPs are designed to capture surface runoff from developed areas and improve the quality of the runoff from the site by removing pollutants through processes such as sedimentation, plant uptake, filtration, microbial activity, etc.

Structural BMPs are generally the costliest of the various BMPs to implement and to maintain. Most potential BMP owners are generally aware of the initial construction costs and land allocation that is required for structural BMPs, but some do not fully understand or appreciate the responsibility and costs associated with the maintenance of stormwater BMPs. This manual presents design, installation, and maintenance guidelines for each structural BMP.

This manual describes each structural BMP and provides design guidelines to make the BMP as efficient as possible in removing pollutants. The manual points out which BMPs are acceptable to use to meet water supply watershed protection regulations for high density development and the associated minimum design requirements. The manual describes each BMP's ability to incorporate peak flow reduction and their credit potential toward the stormwater utility fee. The manual also provides guidelines on selecting the best BMP for certain site conditions.

The following structural BMPs are discussed in Sections 3.4, 3.5, and 3.6 of this manual. Section 3.4 presents BMP selection guidelines, regulatory considerations and design information for each structural BMP. Section 3.5 provides general installation guidelines, while Section 3.6 provides inspection and maintenance guidelines for each structural BMP.

- ⇨ Grass swales
- ⇨ Filter strips
- ⇨ Dry detention basins
- ⇨ Wet detention ponds
- ⇨ Stormwater wetlands
- ⇨ Bioretention areas
- ⇨ Sand filtration facilities
- ⇨ Proprietary stormwater treatment facilities

3.2 Pollution Prevention BMPs

3.2.1 Employee Education

Description

Employee education programs are designed to educate employees on the proper operational practices to minimize the potential for on-site pollutants to contact stormwater runoff. Through education, employees become more aware of potential stormwater pollutants, runoff characteristics, spill control measures, and methods to minimize off-site migration of polluted stormwater runoff from commercial and industrial properties. As a result, it is one of the easiest to implement and most beneficial pollution prevention BMPs available. In addition, a proper employee education program outlines methods by which employees can also reduce potential for stormwater pollution at their individual residences.